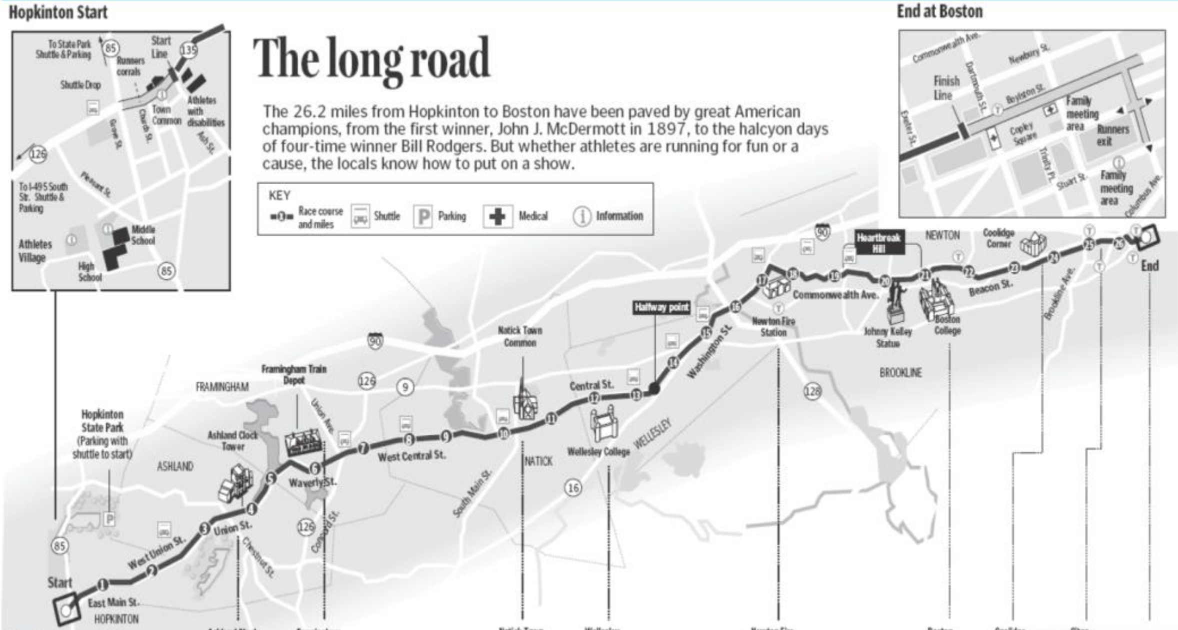
Amateur Radio on the Edge
April 15, 2013

TOW ZONE
NO STOPPING ANY TIME
MASSACHUSETTS EMERGENCY MANAGEMENT
MASSACHUSETTS STATE POLICE

BOSTON ATHLETIC ASSOCIATION

BOSTON MARATHON®
2013

The Boston Marathon, Monday, April 15, 2013



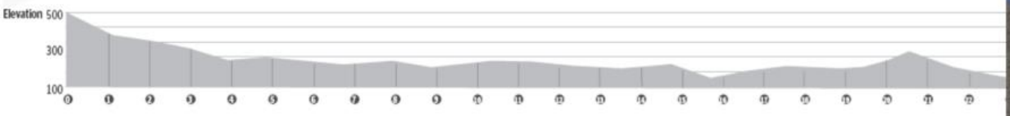
The long road

The 26.2 miles from Hopkinton to Boston have been paved by great American champions, from the first winner, John J. McDermott in 1897, to the halcyon days of four-time winner Bill Rodgers. But whether athletes are running for fun or a cause, the locals know how to put on a show.

KEY
Race course and miles
Shuttle
Parking
Medical
Information

Expected arrival times

	START Mile 0	Ashland Clock Tower Mile 4	Framingham Train Depot Mile 6.2	Natick Town Common Mile 10	Wellesley College Mile 12.3	Newton Fire Station Mile 17.4	Boston College Mile 21	Co C Mi
Lead men:	10:00 a.m.	10:18 a.m.	10:29 a.m.	10:48 a.m.	11:00 a.m.	11:26 a.m.	11:44 a.m.	11
Lead women:	9:35 a.m.	9:55 a.m.	10:08 a.m.	10:30 a.m.	10:42 a.m.	11:10 a.m.	11:28 a.m.	11
Wheelchair men:	9:25 a.m.	9:37 a.m.	9:43 a.m.	9:55 a.m.	10:02 a.m.	10:18 a.m.	10:31 a.m.	10
Wheelchair women:	9:25 a.m.	9:40 a.m.	9:46 a.m.	10:01 a.m.	10:09 a.m.	10:30 a.m.	10:50 a.m.	11



- 117th Boston Marathon
- 26.2 miles
- 26,839 runners
- Over 500,000 spectators
- Coincides with a Red Sox home game

The long road

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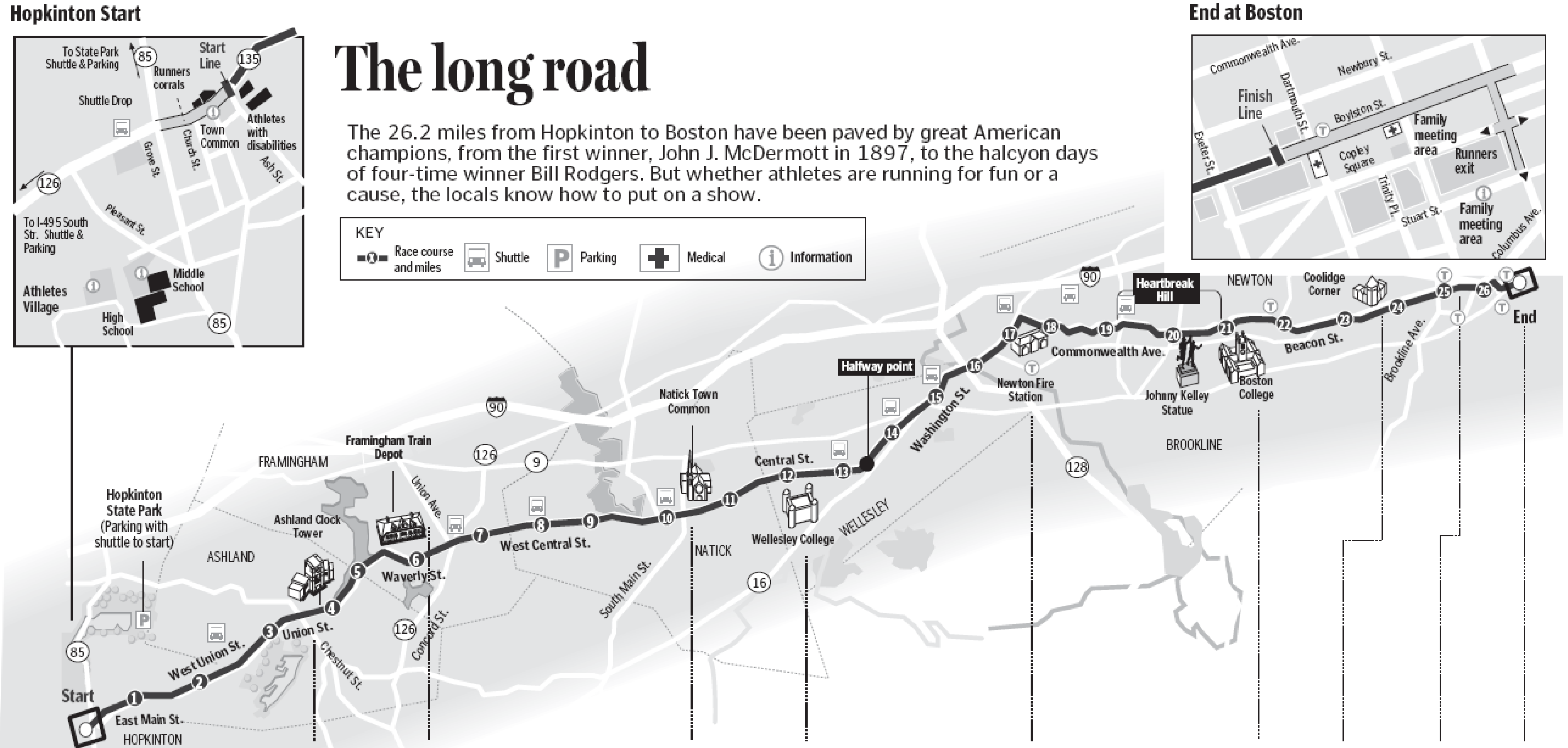
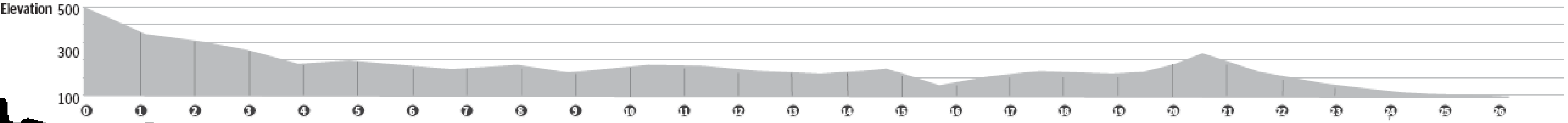


Expected arrival times

	START	Ashland Clock Tower	Framingham Train Depot	Natick Town Common	Wellesley College	Newton Fire Station	Boston College	Coolidge Corner	Citgo Sign	END
	Mile 0	Mile 4	Mile 6.2	Mile 10	Mile 12.3	Mile 17.4	Mile 21	Mile 23.9	Mile 25.2	Mile 26.2
Lead men:	10:00 a.m.	10:18 a.m.	10:29 a.m.	10:48 a.m.	11:00 a.m.	11:26 a.m.	11:44 a.m.	11:56 a.m.	12:00 p.m.	12:08 p.m.
Lead women:	9:35 a.m.	9:55 a.m.	10:08 a.m.	10:30 a.m.	10:42 a.m.	11:10 a.m.	11:28 a.m.	11:46 a.m.	11:53 a.m.	11:59 a.m.
Wheelchair men:	9:25 a.m.	9:37 a.m.	9:43 a.m.	9:55 a.m.	10:02 a.m.	10:18 a.m.	10:31 a.m.	10:40 a.m.	10:44 a.m.	10:47 a.m.
Wheelchair women:	9:25 a.m.	9:40 a.m.	9:46 a.m.	10:01 a.m.	10:09 a.m.	10:30 a.m.	10:50 a.m.	11:05 a.m.	11:19 a.m.	11:23 a.m.



The Boston Marathon is not only a world-class running event, it’s also a world-class public service event that requires the skills and talents of well over 250 amateur radio operators.

- Provide critical communications before, during and after the race.
- Radio operators are located throughout the one-of-a-kind linear race course.
- Assignments:
  - Starting line.
  - Water stations.
  - First-aid stations.
  - Information runner.
  - Transport buses.
  - Finish line.
  - Emergency Management Agency.
  - Emergency Operation Center.
- Experienced radio operators man the net control operations center.
- The communications system is a web, divided into sections, that requires discipline, diligence and determination.
- Seven primary communication channels, two bus and misc. backup channels
- World-class runners can complete the course in just over two hours.
- Radio operators (150) could be on station and working for at least eight to ten hours.
- Weather can be extreme.
- Highly taxing both physically and emotionally.

Communications Protocol

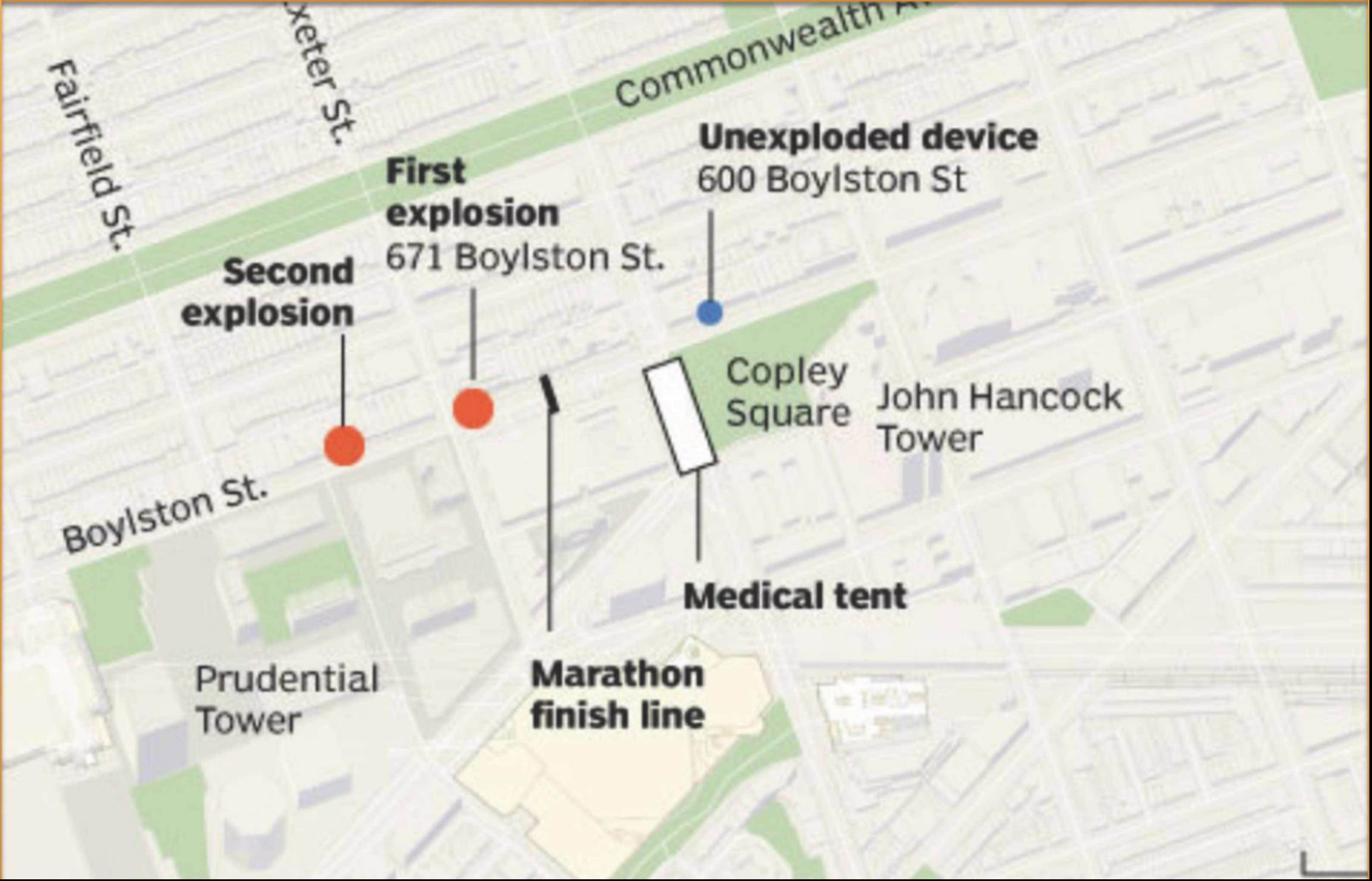
- Stay focused
- Do not clog the frequencies with unneeded requests
- Follow established protocols
- Reply with a calm voice.
- Make concise transmissions
- **Be vigilant**
- Keep your unit informed with Need to Know information and avoid Nice to Know Information
- https://piazza.com/class_profile/get_resource/i72is2mi7505ao/i8015cbjbdi1mx
- Two radios

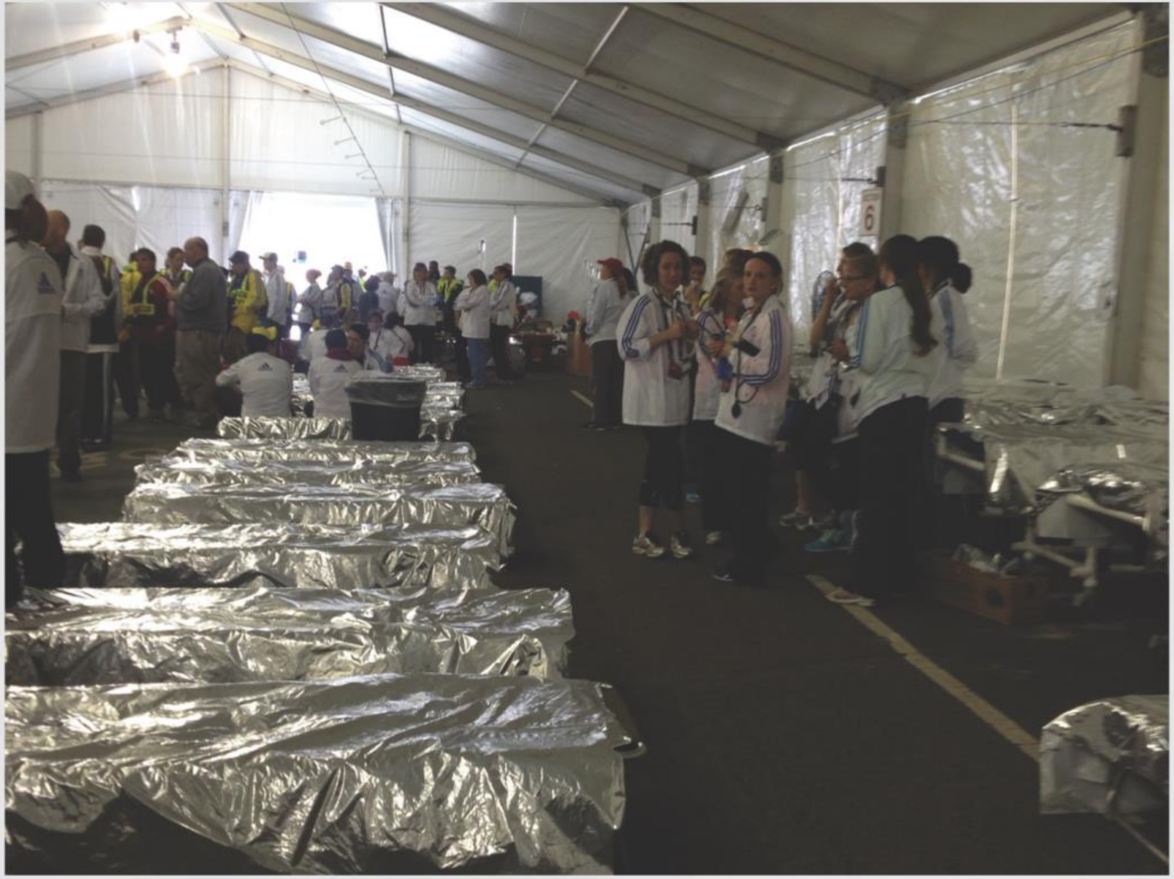
- A handful of ham radio operators are stationed at net control on radios tuned to specific frequencies. Each frequency covers a portion of the race course.
- Think of the race course as a line of linked sections. Each section is assigned a different frequency and has a net of its own.
- Each individual amateur radio operator working at net control has a certain number of water and first-aid stations under his/her control.

Communications Guideposts
Six Objectives

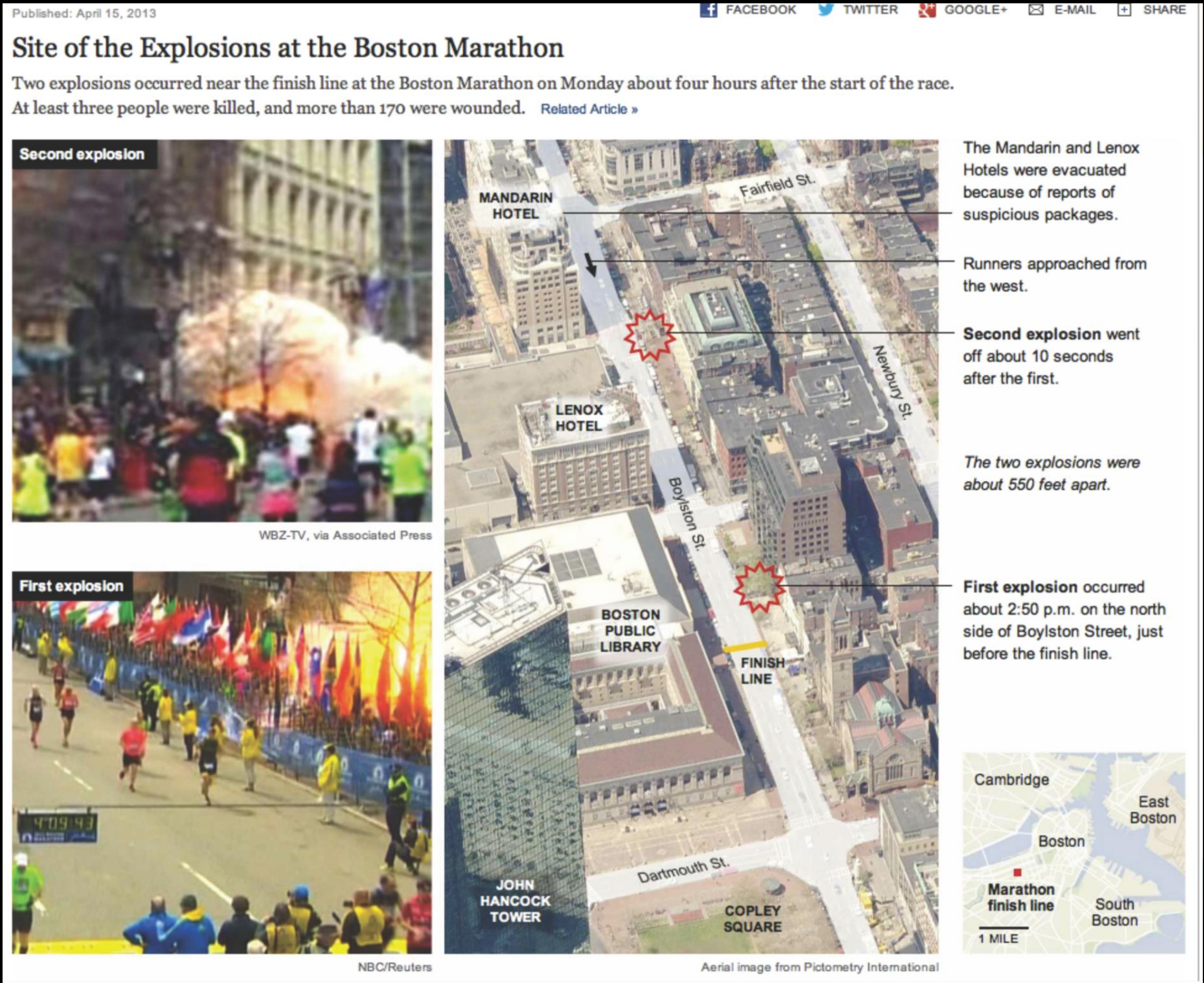
- 1. Maintain a Strict Listening Watch
- 2. Clarity and Intent
- 3. Brevity
- 4. Accuracy
- 5. Unambiguity
- 6. Efficiency
- **Maintain a Strict Listening Watch**

Boston Marathon Finish Line & Medical Tent





Inside Medical Tent A



Published: April 15, 2013

Site of the Explosions at the Boston Marathon

Two explosions occurred near the finish line at the Boston Marathon on Monday about four hours after the start of the race. At least three people were killed, and more than 170 were wounded. Related Article »

Second explosion

WBZ-TV, via Associated Press

First explosion

NBC/Reuters

The Mandarin and Lenox Hotels were evacuated because of reports of suspicious packages.

Runners approached from the west.

Second explosion went off about 10 seconds after the first.

The two explosions were about 550 feet apart.

First explosion occurred about 2:50 p.m. on the north side of Boylston Street, just before the finish line.

Aerial image from Pictometry International

The Bombs

Evidence found near the blast sites included bits of metal, nails, ball bearings, black nylon pieces from a backpack, remains of an electronic circuit board, and wiring.

A pressure cooker lid was found on a nearby rooftop. Both of the improvised explosive devices were pressure cooker bombs manufactured by the bombers.

Authorities confirmed that the brothers used bomb-making instructions found in Al Qaeda in the Arabian Peninsula's *Inspire* magazine.

Fireworks had been purchased from a fireworks store in New Hampshire.

The Victims

14 Lost limbs
264 estimated injuries (Treated at 27 hospitals)
Three people were killed in the bombing:

  Krystle Marie Campbell, a 29-year-old restaurant manager, killed by the first bomb.

  Lü Lingzi, a 23-year-old Chinese national and Boston University statistics graduate student from Shenyang, Liaoning and 8-year old Martin William Richard from the Dorchester neighborhood of Boston, were killed by the second bomb.

Events following the bomb blasts

- Rescue workers and medical personnel, on hand as usual for the marathon, gave aid as additional police, fire, and medical units were dispatched, including from surrounding cities as well as private ambulances from all over the state. T
- The explosions killed 3 civilians and injured an estimated 264 others, who were treated at 27 local hospitals.
- At least 14 people required amputations, with some suffering traumatic amputations as a direct result of the blasts.
- Police, following emergency plans, diverted arriving runners to Boston Common and Kenmore Square.
- The nearby Lenox Hotel and other buildings were evacuated.
- Police closed a 15-block area around the blast site; this was reduced to a 12-block crime scene on April 16.
- Boston police commissioner Edward F. Davis recommended that people stay off the streets.

Events following the bomb blasts

- Dropped bags and packages, abandoned as their owners fled from the blasts, increased uncertainty as to the possible presence of more bombs and many false reports were received.
- An unrelated electrical fire at the John F. Kennedy Presidential Library in nearby Dorchester was initially feared to be a bomb.
- Emergency services at work after the bombing
- The airspace over Boston was restricted, and departures halted from Boston's Logan International Airport.
- Some local transit service was halted.
- The Massachusetts Emergency Management Agency suggested people trying to contact those in the vicinity use text messaging instead of voice calls because of crowded cellphone lines. Cellphone service in Boston was congested but remained in operation, despite some local media reports stating that cell service was shut down to prevent cell phones from being used as detonators.

Events following the bomb blasts

- The American Red Cross helped concerned friends and family receive information about runners and casualties.
- The Boston Police Department also set up a helpline for people concerned about relatives or acquaintances to contact and a line for people to provide information.
- Google Person Finder activated their disaster service under *Boston Marathon Explosions* to log known information about missing people as a publicly viewable file.
- Due to the closure of several hotels near the blast zone, visitors were left with nowhere to stay; many Boston-area residents opened their homes to them.

Events following the bomb blasts

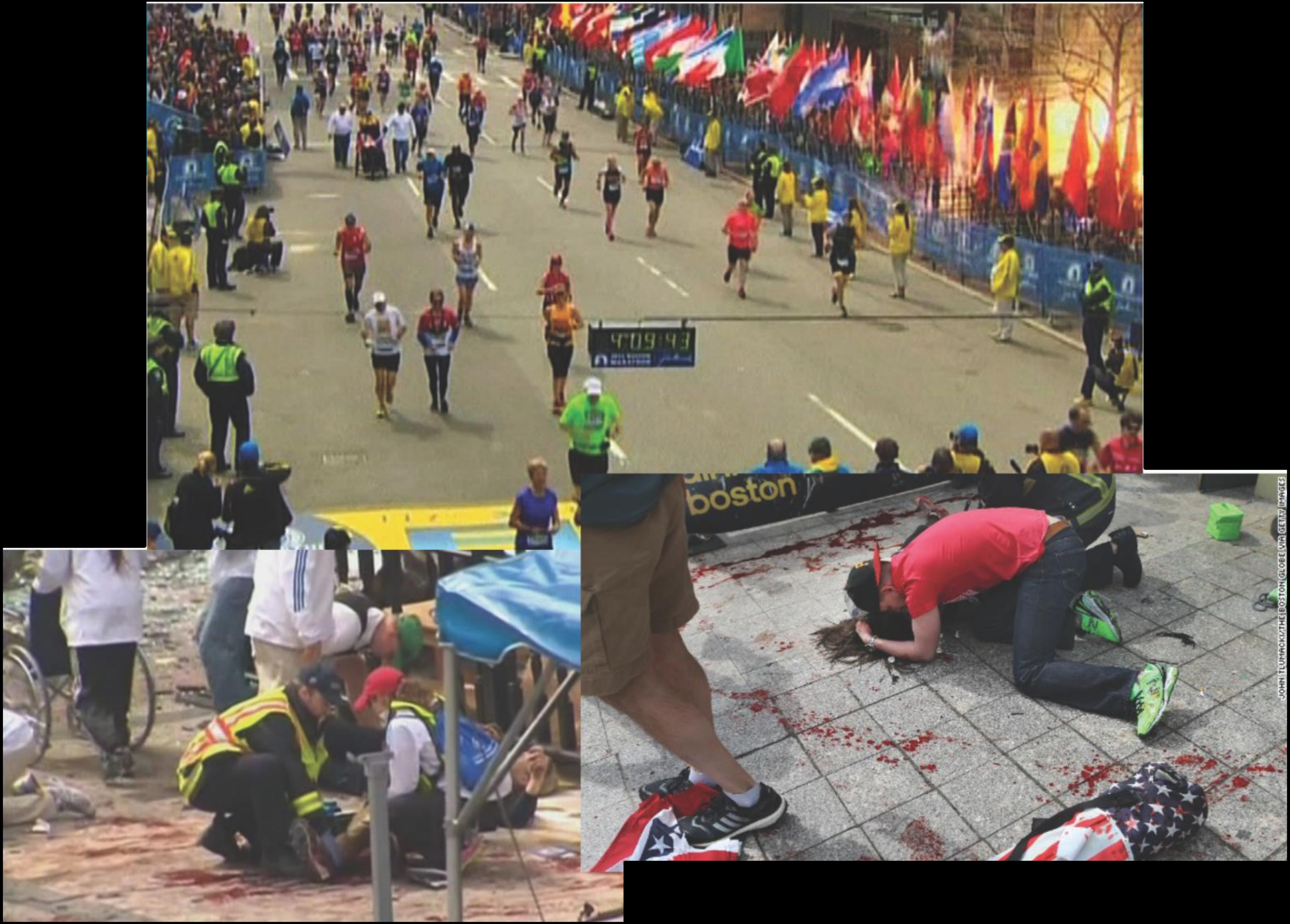
- The amateur radio net control station knew immediately what had happened and commenced a roll call of all ham operators and medical tents.
- Following the explosion and roll call, the net control station began pulling together updates and sent the information via the Massachusetts Emergency Management Agency (MEMA) Web-EOC software tool and provided updates via Amateur Radio.
- Several shelters were set up along the route at churches and schools, and Amateur Radio operators from secured first aid stations went to those shelters, providing communications in those areas until runners were moved out of their locations.
- State Police authorities initially ordered the net control station to lock down and post a ham for security watch outside the net control trailer.

Boston Marathon Bombings: Medical Response Activities at the Incident Site
LLIS.gov

- “Within minutes, Tent A medical personnel started receiving victims, many of which had suffered traumatic amputations and were severely injured.”

Events following the bomb blasts

- Course section net control stations, were set up away from the bombings and continued to control their section nets.
- Over a dozen amateurs at the net control center pooled together to announce messages and keep status of changes along the course route as required
- Net Control Center Coordinator, Karen Brothers, K1KEB, kept in constant contact with Massachusetts Emergency Management Agency (MEMA), where Terry Stader, KA8SCP, was stationed. Stader became the MEMA ‘Ops’ point person at the State Emergency Operations Center
- Runners were transported from the shelters to other staging locations.
- The sheltering plan, reception centers for the runners, and subsequent transport of runners from shelter locations were coordinated by the MEMA
- MEMA also provided information on Massachusetts transportation (bus and train operations)



JOHN TLUMACKI/THE BOSTON GLOBE VIA GETTY IMAGES

Events following the bomb blasts

- The ARES sub-regional command center at the Acushnet, Massachusetts EOC (under call sign WA1EMA) was utilized as a control point to obtain critical situational awareness of the rapidly changing situation, as well as to monitor resource nets per a report filed by Acushnet Emergency Management Communications Officer Ed Caron, KA1RSY.
- A total of five Amateur Radio operators were deployed to this facility. An ARES resource net was called on the 147.18 Bridgewater repeater with Byron Piette, K1YCQ, as net control with 11 stations checking into the net.
- “In terms of having amateurs within ARES who cannot get directly involved in the marathon, we have a process where we have them monitor in case of a situation like what occurred on Monday. That process paid off and facilitated a rapid response to our request for possible additional support,” said Carl Aveni, N1FY.

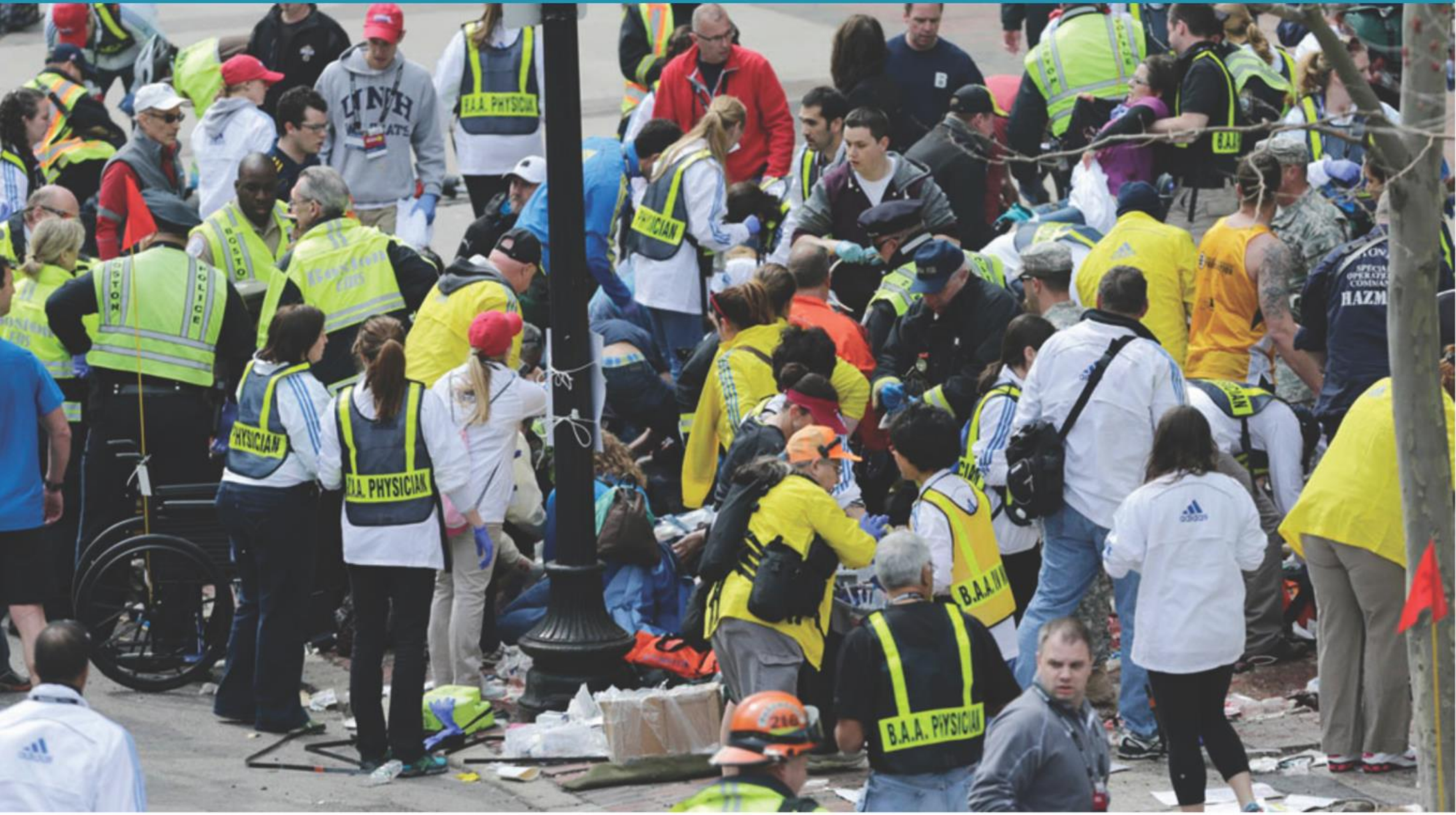
Events following the bomb blasts

- Section net control stations added operators, to allow one person to operate the radio while the other listened and logged priority calls and ambulance requests, to create a more efficient operation.
- Several ambulance requests for dehydration and exhaustion were handled due to the runners needing to be stopped
- One nets that provided a link between the marathon course was assigned to provide a link with the American Red Cross

Event Issues following the bomb blasts

Further down the course, especially in the last mile or two, thousands of runners were still approaching the finish line. The bombs created a new set of problems:

- How do the runners stay warm?
- How do the runners get fed?
- How do the runners get to their belongings?
- How do the runners discover if their loved ones waiting at the finish are okay?
- How do the runners let their loved ones know where they are?
- How will thousands of runners be transported to who-knows-where?



- Significant professional medical presence at the finish line

PUBLISHED: 04/19/2013 9:35:34

CHARLES KRUPA/AP

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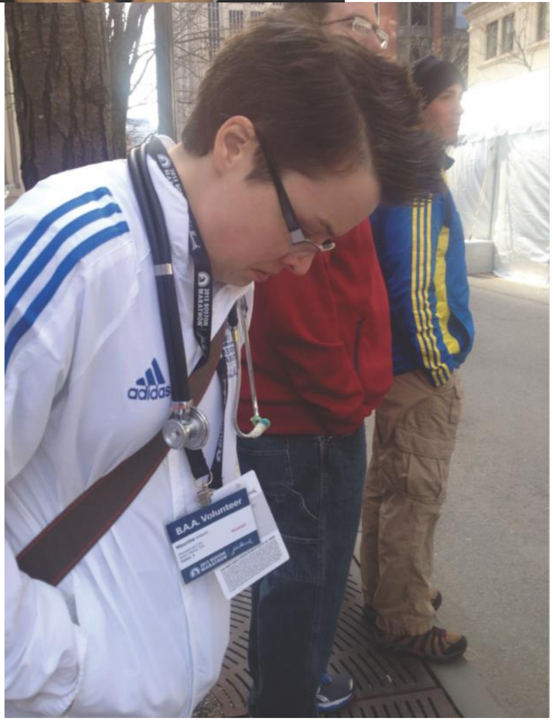
B.A.A. PHYSICIAN

CAPE COD

General Public to the rescue

- Very few lives lost because people on site stayed and helped
- Tourniquets (May save your life)

Think through your role before you go and to what level you can operate



Am I a First Responder or a Victim?

Christina H. Hernon, M.D.
Assistant Professor
Emergency Medicine & Medical Toxicology
University of Massachusetts Medical School

NDLSF
National Disaster Life Support Foundation

NDLS Annual Meeting July 16-17, 2013 Atlanta, GA USA

Professional Appearance

- Giving information to Police and others.
  - ID Badge
  - Standard uniform (ARES Vest)
- Dress to instruct and command.
- Protection in a dangerous response area.
  - Boots

Other Communications

- Keep a list of responders and contact information
  - Emergency Contact during an event
    - NCS
  - Contact after an event
    - ARES EC
  - Crime Scene?

Preparedness

- Third Party Traffic
- Reliable communications from **buses**
- Resource net
- Hams not able to assist on site may be asked to monitor
- Roll call
- Is your watch set correctly?
- Waterproof Notebook
- Preprogram your radio
- Can you program your radio quickly?
- Extra radio

A Teaching Affiliate
of Harvard Medical School

Massachusetts General Hospital

Boston Marathon Bombing

Response and Recovery

July 17, 2013

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Exercises and Trainings

- In the past 5 years MGH has conducted over 150 exercises and training sessions
  - Weekly New Employee Orientation Session http://www.massgeneral.org/emergencymedicine/news/multimedia.aspx?id=624
  - Administrator On-call training and continuing education
  - 10-15 tabletop, functional, or full scale exercises per year
- Participants include:
  - Materials Management, Environmental Services, Patient Care Services, Emergency Departments, Perioperative Services, Buildings and Grounds, Engineering, Information Systems, Telecom, Police & Security, Safety Department
  - External partners: Boston Police Department, Boston EMS, Boston Fire department, and other local and regional hospitals

Include served agencies in ARES exercises

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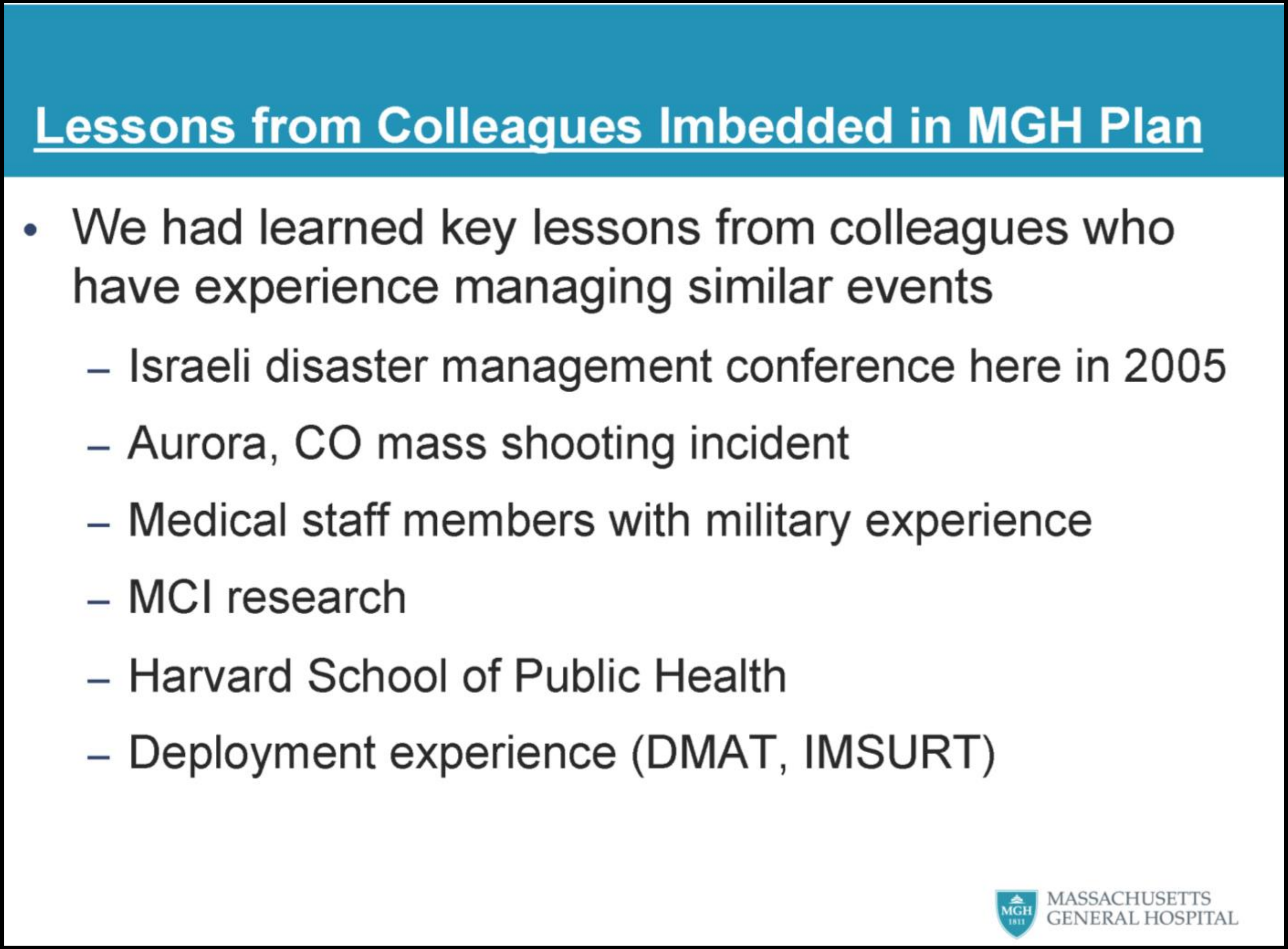

Lessons from Colleagues Imbedded in MGH Plan

- We had learned key lessons from colleagues who have experience managing similar events
  - Israeli disaster management conference here in 2005
  - Aurora, CO mass shooting incident
  - Medical staff members with military experience
  - MCI research
  - Harvard School of Public Health
  - Deployment experience (DMAT, IMSURT)

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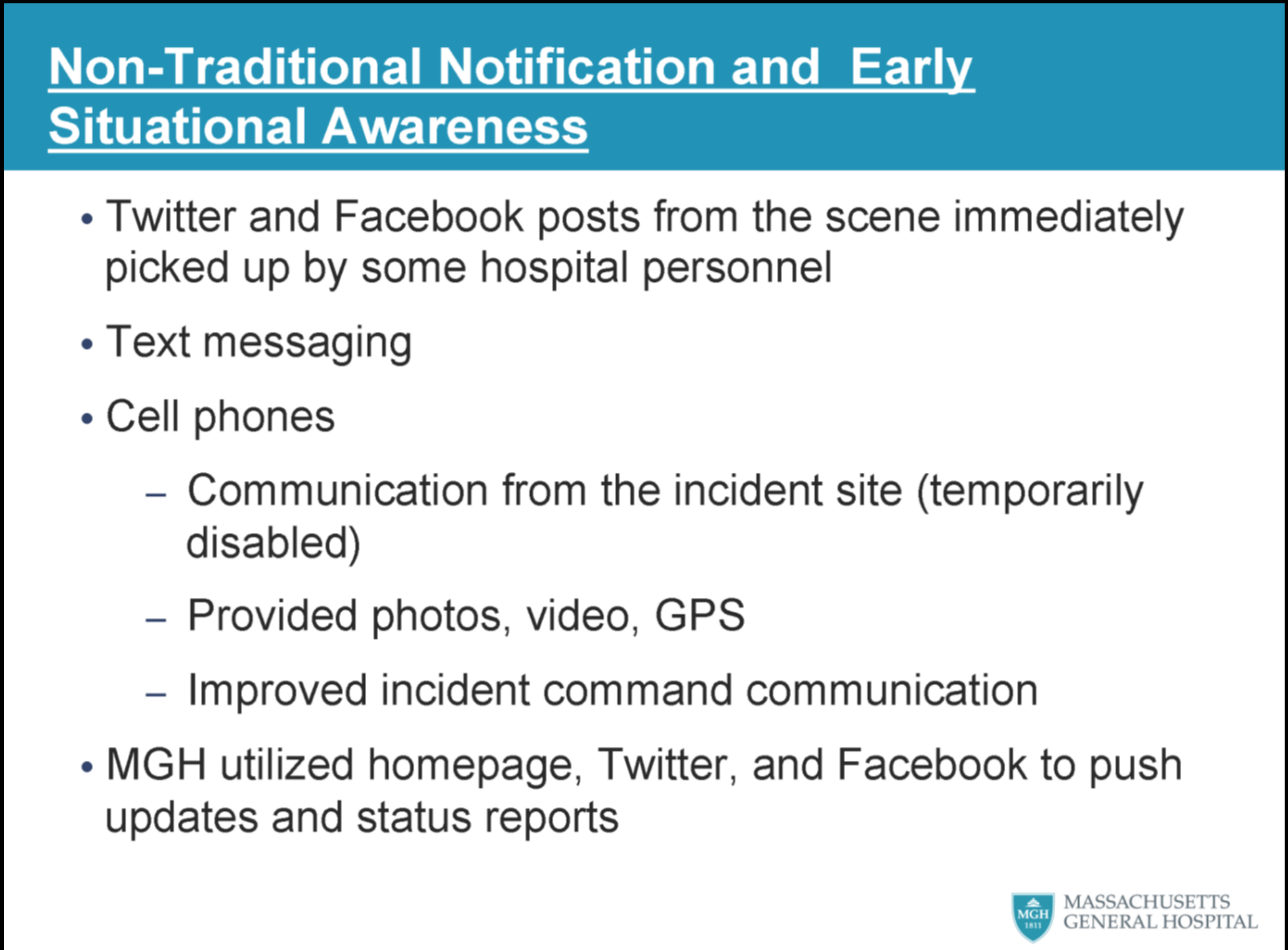
- Involvement
  - Every event provides you with the opportunity to know what to do when the disaster occurs. Your experience may be important to other team members.



Non-Traditional Notification and Early Situational Awareness

- Twitter and Facebook posts from the scene immediately picked up by some hospital personnel
- Text messaging
- Cell phones
  - Communication from the incident site (temporarily disabled)
  - Provided photos, video, GPS
  - Improved incident command communication
- MGH utilized homepage, Twitter, and Facebook to push updates and status reports

MGH 1811 MASSACHUSETTS GENERAL HOSPITAL

- Communications with field operations were poor. The hospital did not know how many victims to prepare for and had to estimate how many staff members they would need. Field operations did not know the hospital capacity status. Hospitals did not when the flow of victims was finished.
- **Continue to maintain solid communications at Athens Regional and St. Mary's Hospital**

Mitigating Factors

- This event occurred during the day near shift change, which facilitated the response (essentially double coverage of staff). Emergency plans need to consider rapid 24/7 response when staffing will be more limited
- Bombs were detonated outdoors and did not cause any structural collapse requiring extrication
- Bystanders on scene immediately assisted the injured
- Finish line staffed with emergency responders and medical tents
- Close proximity to 6 level-1 hospital trauma centers (BIDMC, BMC, BWH, Children’s, MGH, Tufts)

Patient Injuries

- Multiple below and above the knee amputations
- Severe blood loss
- 2nd and 3rd degree burns
- Open fractures, open wounds, lacerations, embedded shrapnel with tissue injury
- Closed fractures with contusions, sprains and strains
- Head injuries, post-concussion syndrome
- Hearing loss with tympanic membrane injury
- Acute anxiety

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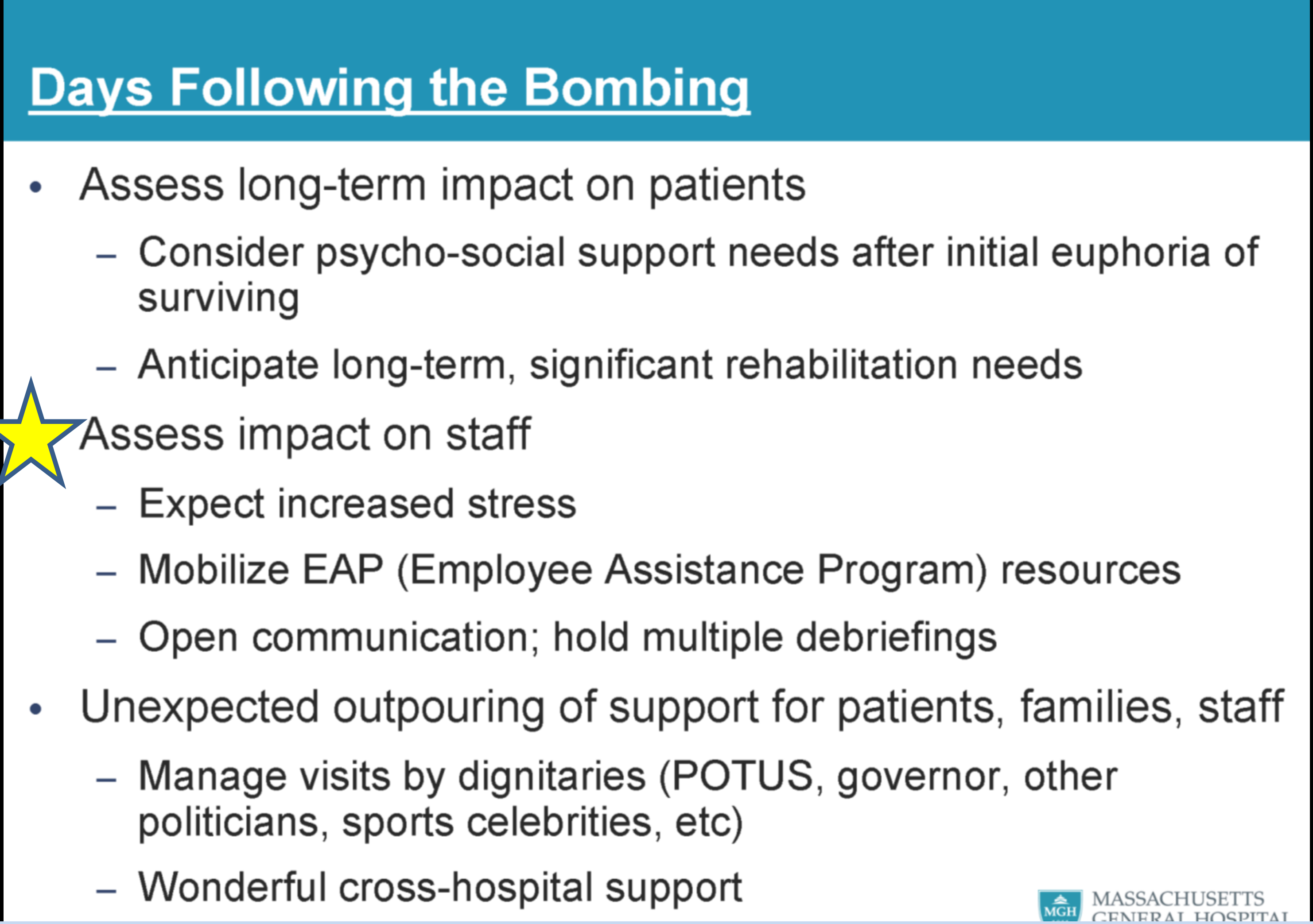
- As amateur radio operators could we observe various levels of physical human trauma?
- Be prepared to communicate injury and medical information



Days Following the Bombing

- Assess long-term impact on patients
  - Consider psycho-social support needs after initial euphoria of surviving
  - Anticipate long-term, significant rehabilitation needs
- Assess impact on staff
  - Expect increased stress
  - Mobilize EAP (Employee Assistance Program) resources
  - Open communication; hold multiple debriefings
- Unexpected outpouring of support for patients, families, staff
  - Manage visits by dignitaries (POTUS, governor, other politicians, sports celebrities, etc)
  - Wonderful cross-hospital support

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- Should amateur radio operators be prepared mentally for such an event? Do we need a presentation on dealing with Post-traumatic Stress Disorder?

MGH Specialty Responses

- Specialty plans have been developed to respond to unique situations that require pre-planning coordination:
  - Nuclear/Radiological
  - Chemical/Hazmat
  - Infectious Diseases
  - Hospital Evacuation
  - MCI protocol
  - Mass Screening Process
  - Hospital Surge
- Special Considerations:
  - Facility "lockdown" (controlled access) procedures for MCI
  - Special evidence handling procedures for contaminated articles
  - Building evacuation plans that differ from the "fire" plan

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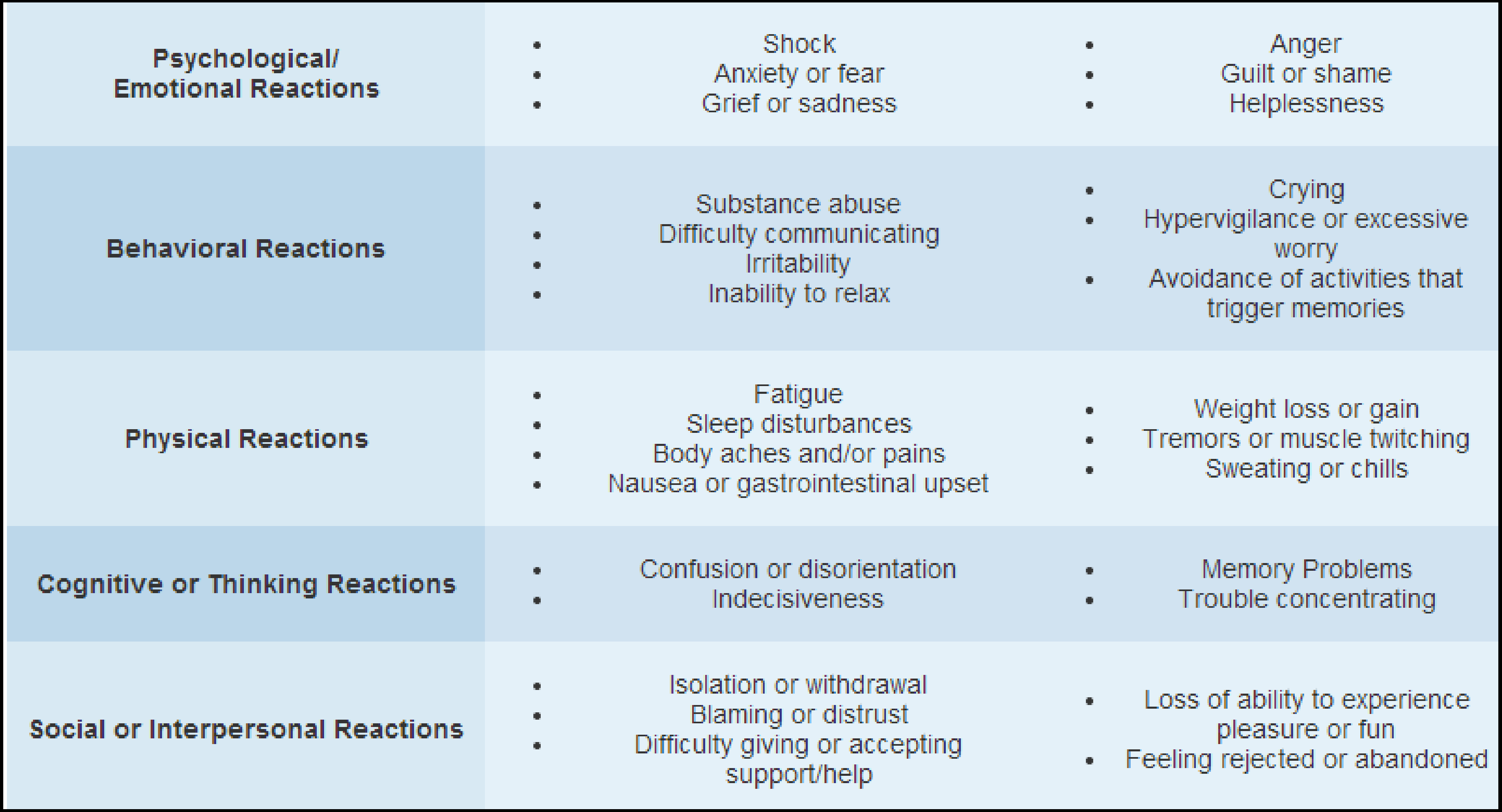
Are you prepared for more than physical injuries?
Are we ready to assist with a hospital evacuation or surge?

Common Stress Reactions Following a Disaster



Psychological/ Emotional Reactions	• Shock • Anxiety or fear • Grief or sadness	• Anger • Guilt or shame • Helplessness
Behavioral Reactions	• Substance abuse • Difficulty communicating • Irritability • Inability to relax	• Crying • Hypervigilance or excessive worry • Avoidance of activities that trigger memories
Physical Reactions	• Fatigue • Sleep disturbances • Body aches and/or pains • Nausea or gastrointestinal upset	• Weight loss or gain • Tremors or muscle twitching • Sweating or chills
Cognitive or Thinking Reactions	• Confusion or disorientation • Indecisiveness	• Memory Problems • Trouble concentrating
Social or Interpersonal Reactions	• Isolation or withdrawal • Blaming or distrust • Difficulty giving or accepting support/help	• Loss of ability to experience pleasure or fun • Feeling rejected or abandoned

Other Issues

- Crowd noise
- Buses needed – do you have equipment to communicate from inside a bus?

Risk Communications (or how to communicate with Police)

- Message effectiveness depends on the audience’s beliefs, attitudes, and emotions toward the information sources.
- Messages are most effective when the sources are perceived as accountable and credible.
- Audience’s beliefs, attitudes, and emotions toward a source are developed through a constant gradual process.

How to be PROFESSIONAL

- Timeliness
- Accuracy
- Effectiveness and Credibility
- Be familiar with the Clarke County EOP and Annexes
- Situation Reports
- Proper appearance
- Proper identification

More important details

- Dress for action – Do you have your Boots on?
- Good physical condition
- Tourniquets
- Prepared to take on an unexpected role
- **Be prepared to operate Net Control off site and setup an Alternate Net Control**
- **Be prepared to operate from locations such as our served agencies: Hospitals, Public Health District 10 EOC, University of Georgia, Clarke County EMA, Northeast Georgia Red Cross**

More important details

- You have only one job as an amateur radio operator: Effective and concise communications.
- Protect yourself and do your job, but do not overlook the possibility that you may have to save a life.

Boston Marathon Amateur Radio Survival Tips

April 17, 2019

https://w1pac.pacmannion.net/2019/04/boston-marathon-survival-tips.html

Working the Boston Marathon
A Survival Guide for First Time Amateur Radio Operators

Tim Carter, W3ATB

https://piazza.com/class_profile/get_resource/i72is2mi7505ao/i770j7dg1ju6k9

Boston Marathon
Amateur Radio Communications
Communication Standards

https://piazza.com/class_profile/get_resource/i72is2mi7505ao/i8015cbjbdi1mx

QUESTIONS?????

Hams Key to NASA's PhoneSat Mission, p. 58

CQ

Amateur Radio

Communications & Technology

July 2013

A Marathon of EmComm After Boston Bombing, p. 13

Ham Radio in Prime Time, p. 18

Results: 2013 CQ WPX RTTY Contest, p. 32

CQ WW VHF Contest July 20-21

On the Cover: Operators from Boston's Marathon Amateur Radio Communications Team shifted from public service to emergency communications after the terrorist bombing at the marathon finish line. Story on page 13.